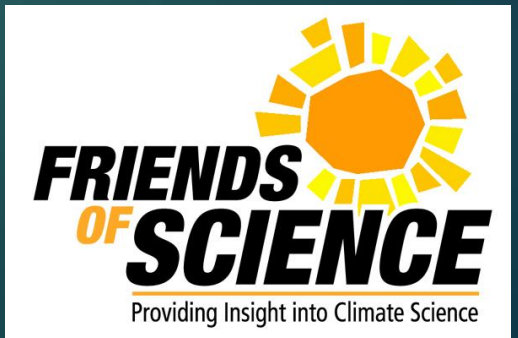


The Myth of the 97% Consensus

BY MICHELLE STIRLING

COMMUNICATIONS MANAGER, FRIENDS OF SCIENCE SOCIETY

THESE ARE THE OPINIONS OF MICHELLE STIRLING BASED ON AVAILABLE EVIDENCE.



About This Presentation

- ▶ Review of the concept of 'consensus' in science
- ▶ Discussion of terms and definitions like 'statisticulation'
- ▶ Review of the 4 most cited 'consensus' studies and statistical breakdown
- ▶ Exploration of psychological themes relevant to groupthink
- ▶ Ethical and economic consequences of 'statisticulation'
- ▶ Summary



This presentation was first given at the: Freedom Talk “Economic Education Association of Alberta” conference March 17-18, 2017.

Leprechaun, ‘green’ and ‘luck’ seemed relevant.

Mike, we are a green energy company, but the green stands for money — *Jeffrey Skilling, President, Enron*

Enron had an influential role in the roots of lucrative carbon trading and climate catastrophe hype, before its scandalous multi-billion dollar collapse in 2001.

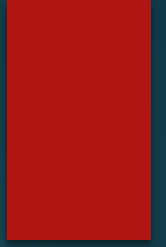
<https://ep.probeinternational.org/2009/05/30/enrons-other-secret/>

Why me?

- ▶ I am not a scientist.
- ▶ I have expertise and experience in advertising and marketing.
- ▶ I have studied various aspects of social psychology.
- ▶ I worked at Alberta Environment for a short time in 2005 when the Sierra Club gave Alberta an 'F' and Ontario a 'B+' despite Alberta Environment having world class/leading policies and implementation on environment and climate. [Alberta's First Climate Leadership Plan was Established in 2002](#)
- ▶ Early on in my working relationship with Friends of Science on climate change, I wondered how it was possible that diverse studies all came up with the same magic consensus number... 97%
- ▶ IF 97% of scientists agreed...was that science? Or compliance? And ...why? Why 97%?
- ▶ Why is 97% consensus claim so integral to climate policy conversations?
- ▶ **Few people would agree to paying more money or subsidies** for wind/solar or other climate change policies that cost more, **for lower performance or reliability** ...
- ▶ ...unless they felt social pressure to agree with (and not question) the view of a huge majority of role dominant experts like scientists.
- ▶ No one wants to be the 'odd man out' or be bullied as a 'denier.'

The Concept of Consensus

Discussion of Relevant Terms



Definitions

- ▶ **Consensus** - “a general agreement about something: an idea or opinion that is shared by all the people in a group.”

Miriam-Webster Dictionary

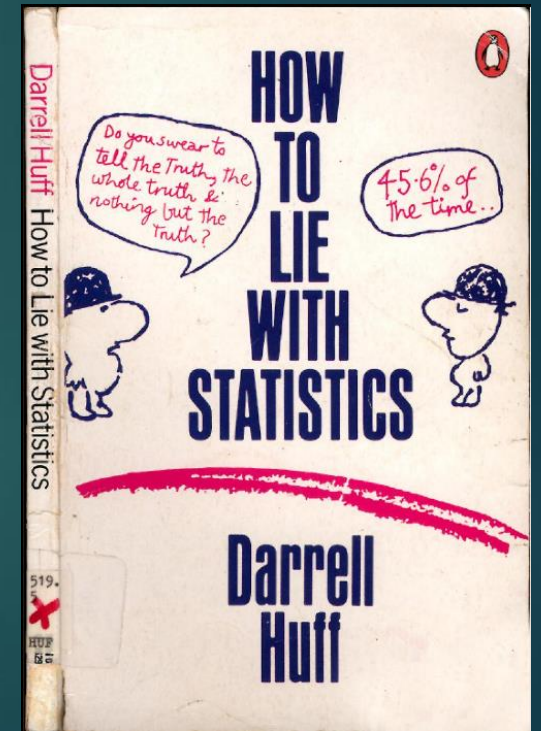
- ▶ “Consensus is not unanimity.”
- ▶ “Unanimity calls for explicit agreement of all Parties. Consensus falls short of that.”

Joyeeta Gupta in “On Behalf of My Delegation...A Survival Guide for Developing Country Climate Negotiators”

- ▶ **Climate change** – human-caused or natural?...time-frame....ratio of human vs natural influence...causative factors (i.e. CO₂, GHGs, land disturbance, water diversion, deforestation, other...)

- ▶ **Statisticulation** – “**statistical manipulation**” - a term coined by Darrell Huff in 1954 in his book “How to Lie with Statistics”

archive.org/details/HowToLieWithStatistics



Is there such a thing as a scientific consensus? Yes....

“Science has progressed through a uniquely productive marriage of human creativity and hard-nosed skepticism, of openness to new scientific contributions and persistent questioning of those contributions and the existing scientific consensus.”



ON BEING A SCIENTIST

RESPONSIBLE CONDUCT IN RESEARCH

COMMITTEE ON SCIENCE, ENGINEERING, AND PUBLIC POLICY

NATIONAL ACADEMY OF SCIENCES

NATIONAL ACADEMY OF ENGINEERING

INSTITUTE OF MEDICINE

NATIONAL ACADEMY PRESS

Washington, D.C.

1995

And No.

**“Science results in knowledge that is often presented
as being fixed and universal.”**

.....

**“Scientific results are inherently provisional.
Scientists can never prove conclusively that they have described some
aspect of the natural or physical world
with complete accuracy.**

**In that sense all scientific results must be treated
as susceptible to error.”**

***“On Being a Scientist”* National Academies Press**

<http://www.nap.edu/read/4917/chapter/2#2>

Consensus is INFLUENTIAL



Barack Obama ✓

@BarackObama



Follow

Ninety-seven percent of scientists agree:
[#climate](#) change is real, man-made and
dangerous. Read more:

May 16, 2013

“97% of Scientists Agree”...

- ▶ Why the 97% figure?
- ▶ What kind of Scientists?
- ▶ What do they agree on?
- ▶ Who says so?
- ▶ We investigated...

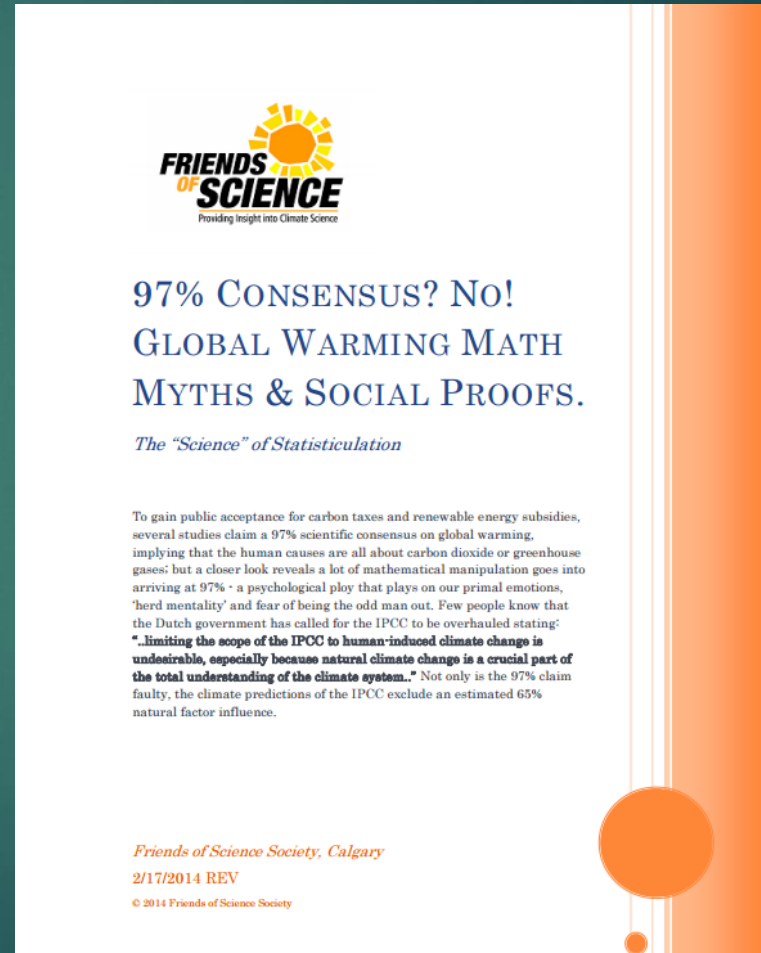
A Review of the Major Consensus Studies

- ▶ Oreskes 2004
- ▶ Doran and Zimmerman 2009
- ▶ Anderegg et al 2010
- ▶ Cook et al 2013

97% Consensus? NO!

Global Warming Math Myths & Social Proofs.

friendsofscience.org/assets/documents/97_Consensus_Myth.pdf



ORESKE'S 2004

- ▶ Originated as part of a speech she gave to a banquet; people found it very interesting
- ▶ Showed up later as an article in Science Magazine in 2004
- ▶ This was published ~4 days before a major climate conference
- ▶ Was not peer-reviewed

The screenshot shows the Science magazine website interface. At the top, there's a navigation bar with the Science logo, AAAS logo, and links for NEWS, SCIENCE JOURNALS, CAREERS, MULTIMEDIA, and COLLECTIONS. Below this is a sub-navigation bar with links like Science Home, Current Issue, Previous Issues, Science Express, Science Products, My Science, and About the Journal. The main content area displays the article 'The Scientific Consensus on Climate Change' by Naomi Oreskes, published in Science 3 December 2004, Vol. 306 no. 5702 p. 1686. The article is categorized under 'ESSAYS ON SCIENCE AND SOCIETY' and 'BEYOND THE IVORY TOWER'. The abstract discusses the uncertainty in climate science and the impact of greenhouse gas emissions. On the left side, there are sections for 'Article Views' (Summary, Full Text, Full Text (PDF)), 'VERSION HISTORY' (Correction for this article), and 'Article Tools' (Save to My Folders, Download Citation, Alert Me When Article is Cited, Post to CiteULike, Article Usage Statistics, E-mail This Page). On the right side, there are 'Related Resources' including 'In Science Magazine' and 'LETTERS' with a link to 'Consensus About Climate Change?'.

Oreskes was then at the Department of History and Science Studies Program, University of California at San Diego, La Jolla, CA 92093, USA.

Roger Pielke, Jr. Challenged Oreskes “Consensus” 2005

- ▶ Published rebuttal in Science Magazine in 2005
- ▶ “Our policies should not be optimized to reflect a single measure of the central tendency...should be robust enough to accommodate the distribution of perspectives...”
- ▶ “we might learn more in the future.”

consensus. A consensus is a measure of a central tendency and, as such, it necessarily has a distribution of perspectives around that central measure (1). On climate change, almost all of this distribution is well within the bounds of legitimate scientific debate and reflected within the full text of the IPCC reports. Our policies should not be optimized to reflect a single measure of the central tendency or, worse yet, caricatures of that measure, but instead they should be robust enough to accommodate the distribution of perspectives around that central measure, thus providing a buffer against the possibility that we might learn more in the future (2).

ROGER A. PIELKE JR.

Oreskes Responded

- ▶ *“Pielke is quite right that understanding the results of scientific research does not implicate us in any particular course of action, and the purpose of my Essay was not to advocate either for or against the Kyoto accords or any other particular policy response. A full debate on the moral, social, political, ethical, and economic ramifications of possible responses to climate change—as well as the ramifications of inaction—would be a very good thing.*

- ▶ Ironically Oreskes then said:

“But such a debate is impeded by climate change deniers.”

sciencepolicy.colorado.edu/admin/publication_files/resource-1761-2005.32.pdf

- ▶ Oreskes CV :

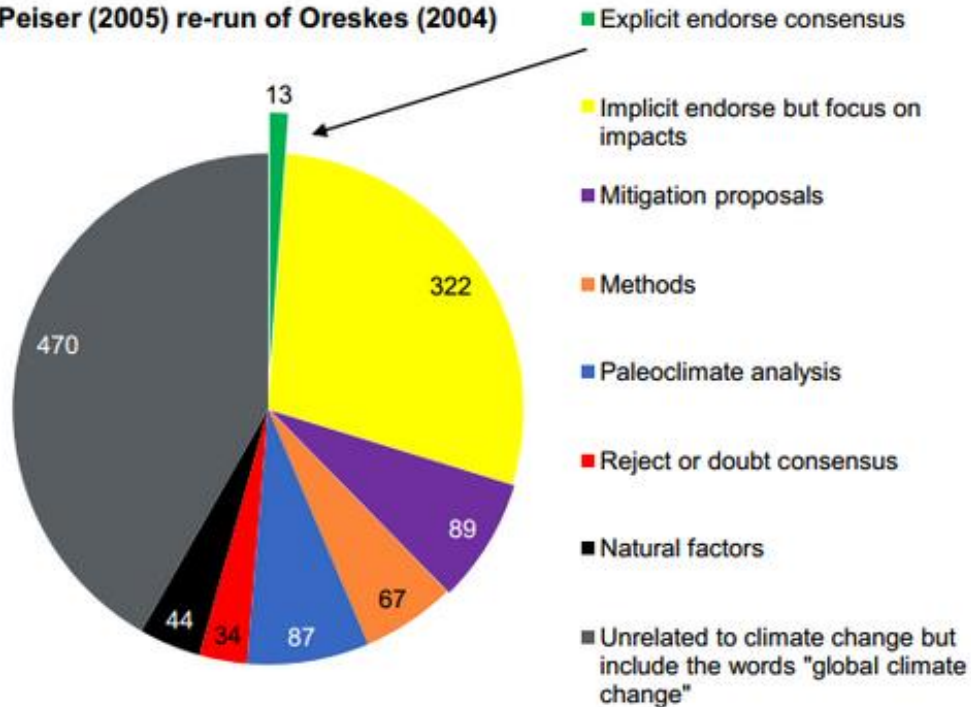
11.

Member, National Academy of Sciences/National Research Council Committee on the Use of Models in Regulatory Decision-Making, 2004-2007.

Consensus Gained a Life of Its Own

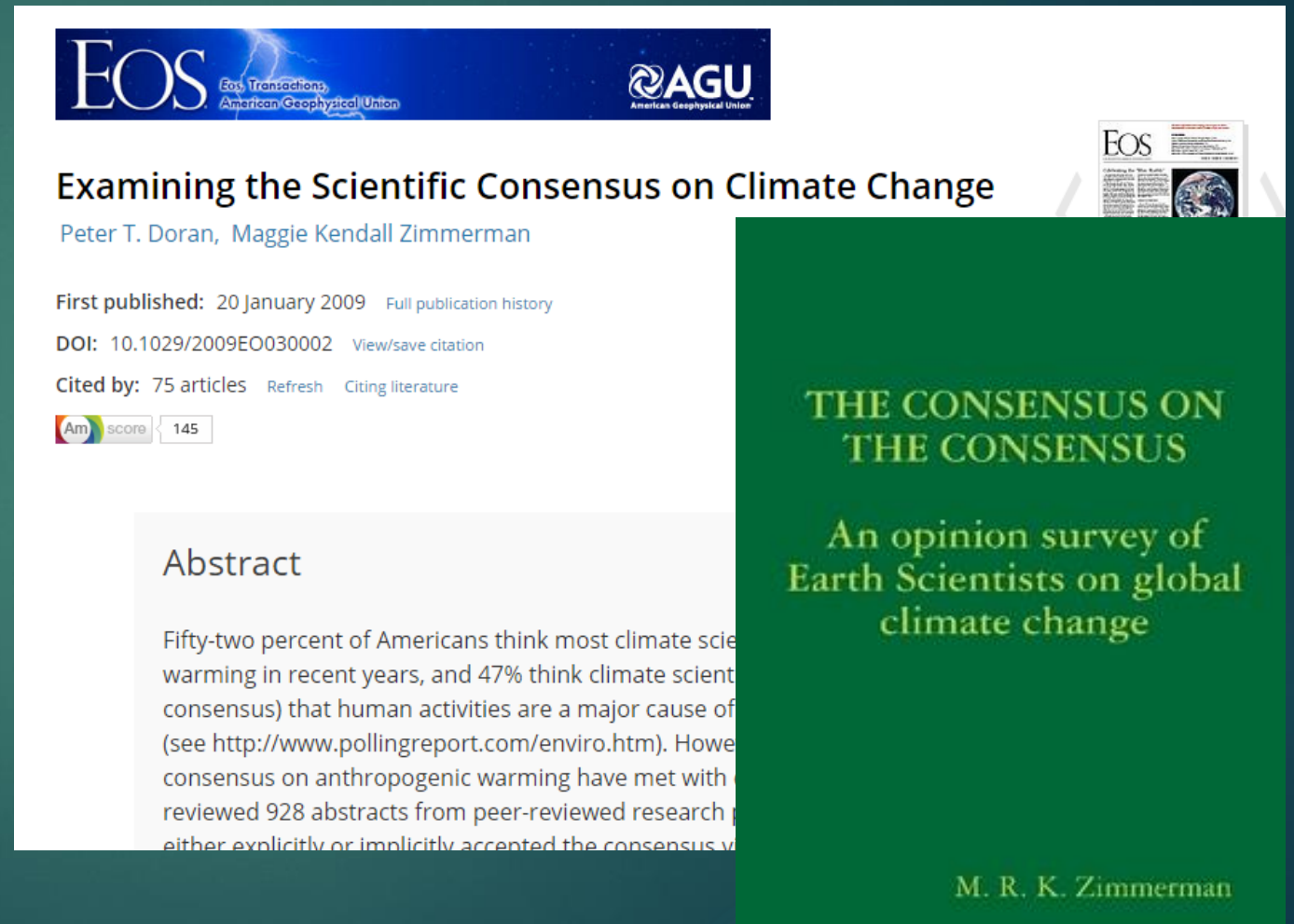
Al Gore said zero scientists disagreed with manmade global warming.
Peiser re-ran Oreske's research & showed
only 13 of 1126, or ~1%, explicitly agreed – most had NO POSITION .

Peiser (2005) re-run of Oreskes (2004)



Doran and Zimmerman 2009

- ▶ Based on Margaret Kendall Zimmerman's MA thesis "The Consensus on the Consensus" (*available on LULU*)
- ▶ Published In EOS of the American Geophysical Union
- ▶ *"The objective of our study presented here is to assess the scientific consensus on climate change through an unbiased survey of a large and broad group of Earth scientists."*



Doran and Zimmerman 2009

- ▶ Began with a pool of 10,257 earth scientists (geologists, geophysicists, etc.)
- ▶ Of those 3,146 responded
- ▶ Of these, **79 “self-selected”** scientists said they were publishing on climate
- ▶ Fundamentally respondents answered 2 opinion questions:
 - *When compared with pre-1800s levels, do you think that mean global temperatures have generally risen, fallen, or remained relatively constant?*
 - *Do you think human activity is a significant contributing factor in changing mean global temperatures?*
- ▶ What's missing? **Empirical parameters**: Science refers to specific timeframes, degrees of change, specific type of human activity or emissions and clear definitions. "Significant" is subjective.

Scientific Debate? Or Consensus

Conclusion: *"It seems that the debate on the authenticity of global warming and the role played by human activity is largely nonexistent among those who understand the nuances and scientific basis of long-term climate processes. The challenge, rather, appears to be how to effectively communicate this fact to policy makers and to a public that continues to mistakenly perceive debate among scientists."*

-Doron and Zimmerman 2009

- ▶ **Nuances?**
- ▶ **Let's look at the original database responses.**

The MK Zimmerman Master of Arts Thesis

- ▶ In the thesis results, a number of scientists wrote to express their views.
- ▶ "Of 38 replies,
 - 37 see natural variability (solar factors, orbits, oceans, etc.) as the drivers of climate change;
 - 5 of those responses also acknowledge some human impact
 - and only one response claims that models show humans are the driver of climate change."

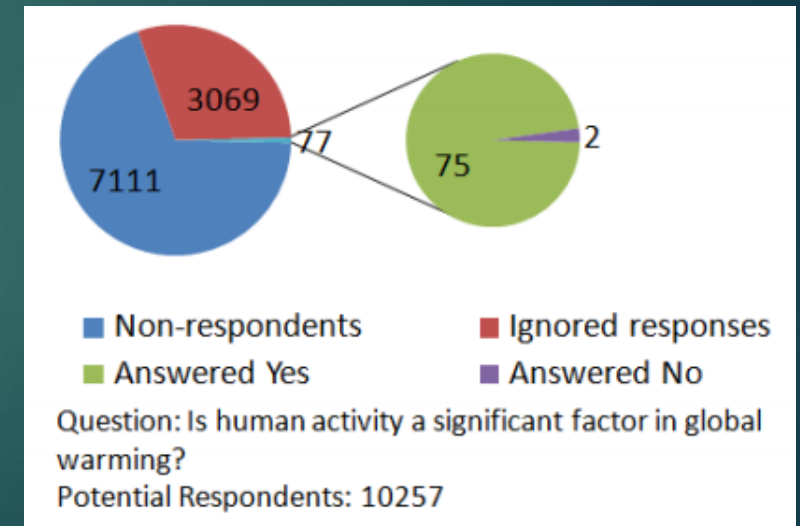
www.friendsofscience.org/assets/documents/Infiltration2015.pdf page 23

- ▶ It is unclear how many others of the 3,146 respondents might have felt this way (or held a different view) but did not bother to write in.
- ▶ Many wrote in to complain about the opinion questions as being unscientific.

Technically 97% Agree with Two Opinion Questions

- ▶ Doran & Zimmerman (2009) relied upon 79 “self-selected” earth scientists with unstated qualifications who claimed to have recently published something on climate change while disregarding the other 3067 respondents.
- ▶ Many of these 3067 respondents protested the style of the questions on grounds that they were inherently unscientific as they called for opinion with no scientific parameters on an empirical topic.

Doran & Zimmerman (2009) Claim of 97%



Doran & Zimmerman (2009) Breakdown of respondents versus self-selected group

What did MK Zimmerman Think?

Zimmerman email response:

“It is challenging to keep our own biases in check when conducting a survey like this. When I said “we have such a clear idea of what we are asking” I meant that we have been over and over many versions of the same questions, looking for the most neutral wording, so it becomes difficult to look at each question through fresh eyes and see where the issues might be.

This entire process has been an exercise in re-educating myself about the climate debate and, in the process, I can honestly say that I have heard very convincing arguments from all the different sides, and I think **I'm actually more neutral on the issue now than I was before I started this project.**

There is so much gray area when you begin to mix science and politics, environmental issues and social issues, calculated rational thinking with emotions, etc...”

Anderegg et al 2010

- ▶ A “Contributed” paper – a special category at the time.
- ▶ Any NAS member could ‘contribute’ 4 such papers a year as long as they were party to the design, they did not have to do the actual research.
- ▶ The contributor could choose 2 of their own qualified colleagues to review it and approve.
- ▶ By contrast, “Direct Submission” peer-review is blind, and 5-8 qualified reviewers are chosen by the editorial board.

PNAS Celebrating 100 Years 1915-2015

Proceedings of the National Academy of Sciences of the United States of America

CURRENT ISSUE // ARCHIVE // NEWS & MULTIMEDIA // AUTHORS // ABOUT // COLLECTED ARTICLES // BROWSE BY TOPIC // EARLY EDITION // FRONT MATTER

Current Issue > vol. 107 no. 27 > William R. L. Anderegg, 12107–12109, doi: 10.1073/pnas.1003187107

CrossMark click for updates

Expert credibility in climate change

William R. L. Anderegg^{a,1}, James W. Prall^b, Jacob Harold^c, and Stephen H. Schneider^{a,d,1}

Author Affiliations

Contributed by Stephen H. Schneider, April 9, 2010 (sent for review December 22, 2009)

Abstract Full Text Authors & Info Figures SI Metrics Related Content PDF PDF + SI

Abstract

Although preliminary estimates from published literature and expert surveys suggest striking agreement among climate scientists on the tenets of anthropogenic climate change (ACC), the American public expresses substantial doubt about both the anthropogenic cause and the level of scientific agreement underpinning ACC. A broad analysis of the climate scientist community itself, the distribution of credibility of dissenting researchers relative to agreeing researchers, and the level of agreement among top climate experts has not been conducted and would inform future ACC discussions. Here, we use an extensive

This Issue

July 6, 2010
vol. 107 no. 27
Masthead (PDF)
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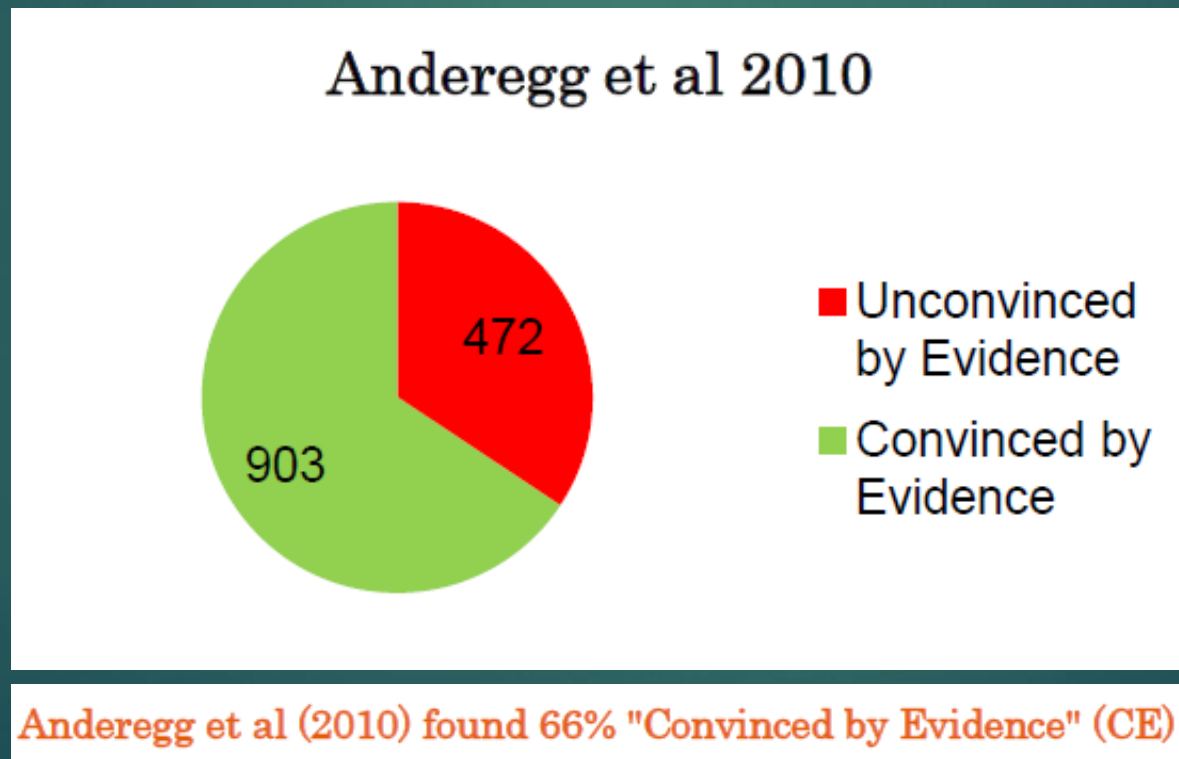
PREV ARTICLE NEXT ARTICLE

View this article with LENS beta

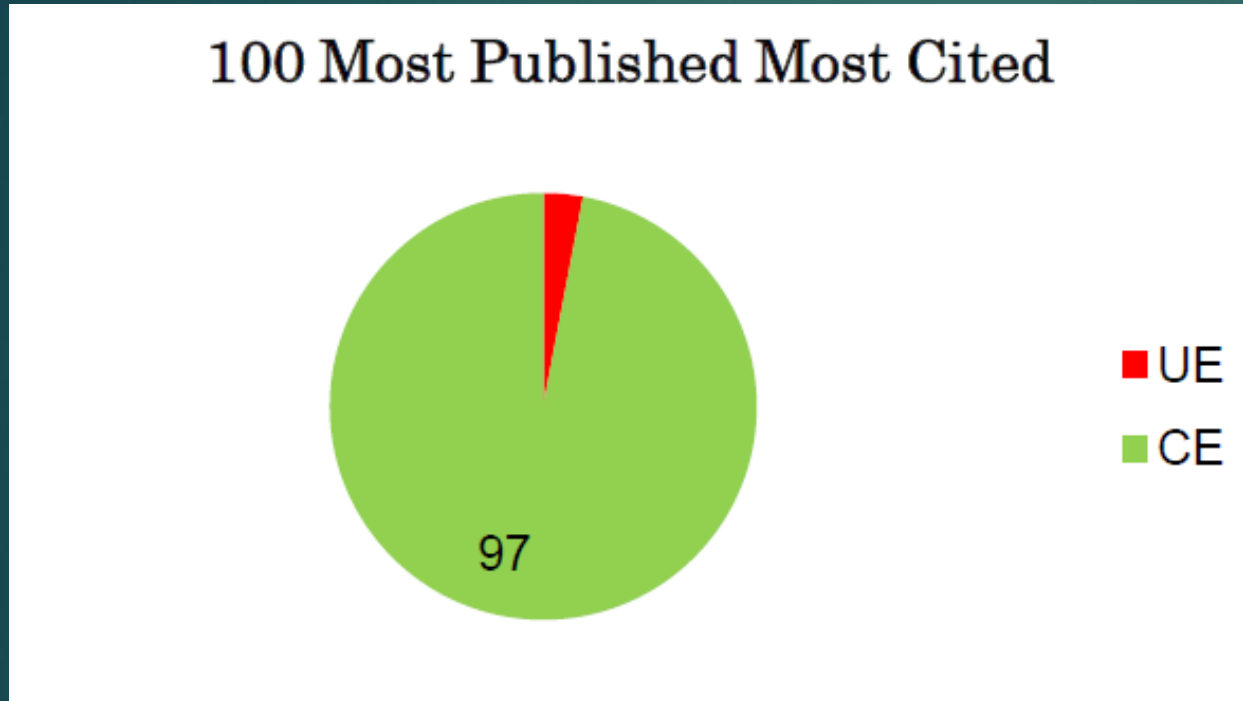
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Anderegg et al 2010 attempted to establish 'credibility' by # of citations using IPCC scientists



How they got to 97%



Anderegg et al (2010) Breakdown of CE/UE in 100 Most Published/Most Cited Papers

Dr. Nir Shaviv's critique of the Anderegg et al method:

"With or without the fancy statistical analysis, and in fact, with or without the data, I could have told you that the scientists in the believer camp should have more papers and many more citations. But this has nothing to do with credibility. It has everything to do with the size of the groups and the way their members behave."

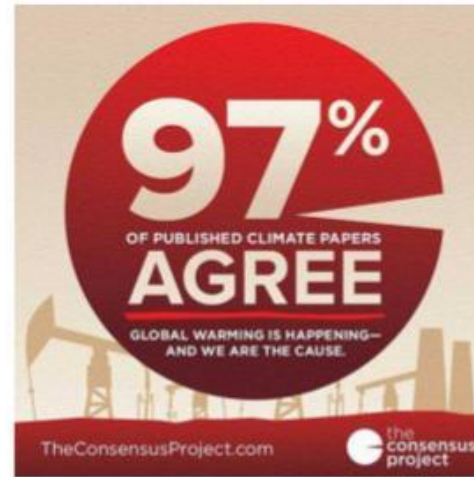
Since the AGW protagonists have the tendency to block the publication of papers that don't follow their party line (and if you think otherwise, read the *climategate* emails), it is way easier for the AGW protagonists to have any paper get published."

<http://www.sciencebits.com/Expert-credibility-in-climate>

Cook et al 2013

- ▶ Cook et al 2013 is widely cited as THE 97% consensus study
- ▶ Their definition was extremely loose “humans cause warming” according to online forum comments
- ▶ In fact most (67%) surveyed held NO position on Anthropogenic Global Warming (AGW – human-caused)
- ▶ Only 0.5% endorsed AGW at >50%
- ▶ Many authors that were reviewed objected to how Cook et al categorized their work

Figure 9: The Cook et al (2013) Dynamic Graphic from “The Consensus Project” web-site

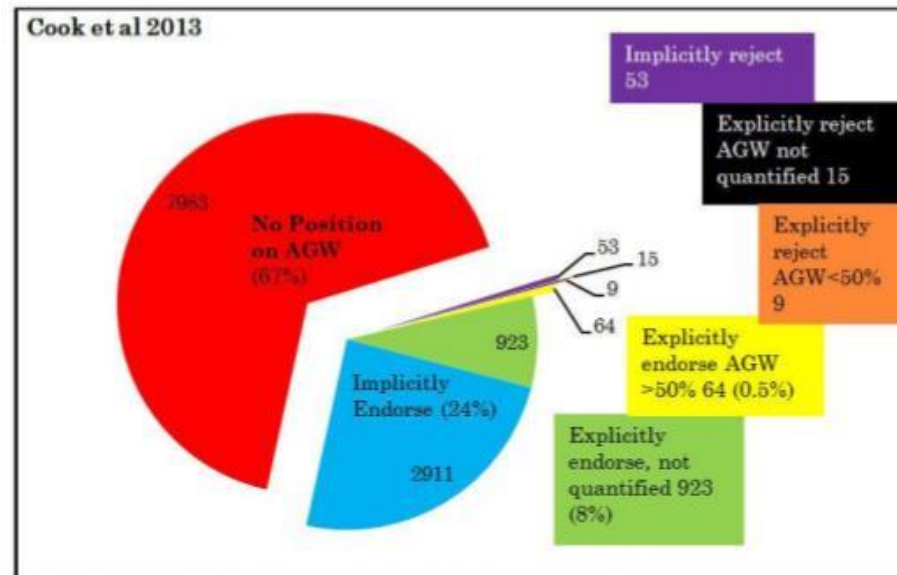


More recently Cook et al (2013) issued “Quantifying the consensus on anthropogenic global warming in the scientific literature” claiming 97% agreement and focusing on fossil fuel use as a cause.[left Figure 9]

However, a detailed review of Cook et al reveals that only 64 papers out of ~12,000 explicitly endorse the AGW declaration that human activity/emissions are more than 50% responsible for recent warming [below Figure 10]. Interesting to note that Cook et al used Houghton’s 1996 definition which includes other activities... “human activities, mostly fossil-fuel use, land-use change and agriculture”

Most of the papers held no position on anthropogenic global warming.

Figure 10: A Deconstruction of the Cook et al (2013)



DECONSTRUCTING 'THE CONSENSUS' on CLIMATE CHANGE

| | Oreskes (2004) | Peiser (reran Oreskes & disputes her findings)(2005) | Doran & Zimmerman (2009) | Anderegg et al (2010) | Cook et al (2013) |
|---|---|---|--|---|--|
| Number of papers & time-frame of publication | 928 (804) (1993-2003) (10 years) | 1117 1993-2003 (10 years) | Database of Earth scientists | By publication and citation; partially based on existing lists drawn up by Prall | 11,944 1991-2011 (21 years) |
| Search Term | 'climate change' (subsequently corrected to 'global climate change') | 'global climate change' | 2 key opinion questions asked w. 7 related parameters | By publication in climate science journals. | "global climate change" or "global warming" |
| Comparison of categories and survey findings | Categories & findings: 1. explicit endorsement of consensus position 2. evaluation of impacts 3. mitigation proposals 4. methods 5. paleoclimate analysis 6. rejection of the consensus position "Of all the papers, 75% fell into the first three categories, either explicitly or implicitly accepting the consensus view; 25% dealt with methods or paleoclimate, taking no position on current anthropogenic climate change. Link, Link | Categories & findings: 1. 13 (1.2%) explicit endorsement of the consensus position 2. 322 (29%) implicitly endorse but focus on evaluation of impacts 3. 89 (<10%) mitigation proposals 4. 67 focus on methods 5. 87 deal with paleoclimate analysis 6. 34 reject or doubt of the consensus position. 7. 44 focus on natural factors of global climate change 8. 470 (44%) include the words 'global climate change' but are unrelated to the question of recent global climate change. Link | Categories & findings: 12,000 database of Earth scientists sent 2 minute on- line survey 10,257 potential respondents, 3,146 responded 79 "climate" scientists (self- selected) formed the 100%. Question 1: Has the earth warmed since pre-1800s? Question 2: Is human activity a significant factor in global warming? Link | 1,372 reduced to 908 Credibility: focussed on 4 most cited papers "Convinced" (CE) or "Unconvinced by evidence" (UE): based on multi- signatory papers signed by researchers. 903 scientists are CE (66%) 472 scientists are UE Scientists were ranked by number of publications. Of the 100 scientists with the most publications, 3% are UE. Link | Categories & findings: 1. 64 explicit endorse, >50% warming caused by man 2. 923 explicit endorse 3. 2911 implicit endorse 4. 7983 no position 5. 53 implicit reject 6. 15 explicit reject 7. 9 explicit reject, <50% warming caused by man 64 explicit endorsements out of 11,958 is 0.54% Link "endorse" means man has caused some warming. The IPCC claims (AR5) it is extremely likely that more than half of the warming since mid-20th century was caused by man. |
| Claims | 75% consensus and 'Remarkably, none of the papers disagreed with the consensus position.' | Only a 1% consensus, contradicting Oreskes' claim. | Claims 97% consensus based on: 76 of 79 answered 'yes' to Question 1 (96.2%) 75 of 77 answered 'yes' to Question 2 (97.4%) | 97-98% of the climate researchers most actively publishing in the field support the IPCC AGW. But only 66% of climate scientists support the IPCC position. | 97% consensus claimed in press releases and on "The Consensus Project" website – 3898 (categories 1, 2, 3) of 3975 (all categories except 4) claim 97% - however many scientists rejected Cook's categorizing of their work. |

The full questions in the Doran & Zimmerman survey: 1. When compared with pre-1800s levels, do you think that mean global temperatures have generally risen, fallen, or remained relatively constant? 2. Do you think human activity is a significant contributing factor in changing mean global temperatures?

No Consensus

Figure 1: Percentage agreement with IPCC AGW declaration and survey numbers

| Surveys by Author Name | Actual % Explicitly Agreeing w. IPCC Declaration | From a Base Survey Number of Respondents or Papers Assessed |
|------------------------|--|---|
| Oreskes/Peiser | 1.2% | ~1,000 |
| Doran and Zimmerman | 2.38% | 3,146 respondents |
| Anderegg et al | 66% | 1,372 scientists |
| Cook et al | 0.54% | 11,944 |

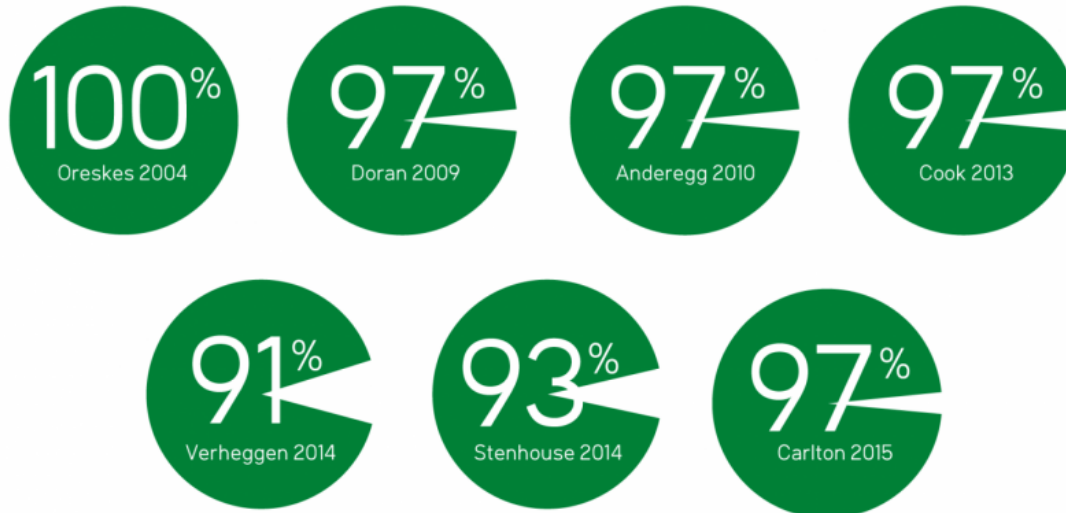
Statisticulation

- Misinforming people by the use of statistical material might be called statistical manipulation; in a word (though not a very good one), “statisticulation.”
- Percentages offer a fertile field for confusion.... they can lend an aura of precision to the inexact.
- Any percentage figure based on a small number of cases is likely to be misleading.

Excerpt of Huff, found in Friends of Science report: “97% Consensus? NO!..”

Consensus on consensus: Expertise matters in agreement over human-caused climate change

April 13, 2016 by Allison Mills



Bringing together authors of seven different consensus studies, Cook and his team show that among climate experts the rate of agreement about human-caused climate change is between 90 to 100 percent. Credit: University of Queensland, John Garrett

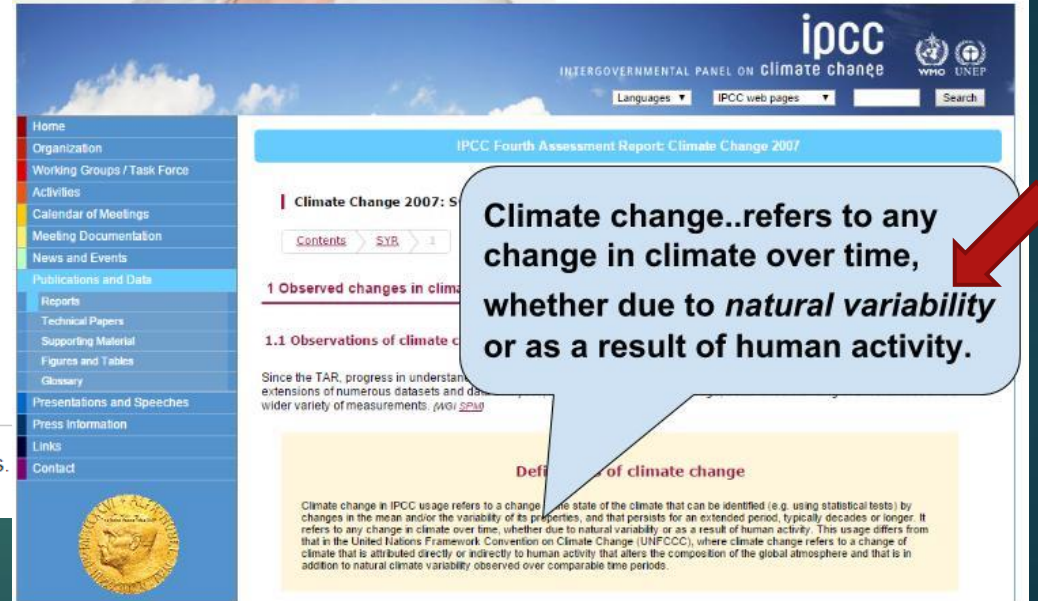
A research team confirms that 97 percent of climate scientists agree that climate change is caused by humans. The group includes Sarah Green, a chemistry professor at Michigan Technological University.



Photo:Twitter

“Friends, climate change is real. It is caused by human activity.”

Nov 22, 2015: “Climate Leadership Plan” speech by Rachel Notley present Premier of Alberta



Climate change..refers to any change in climate over time, whether due to *natural variability* or as a result of human activity.

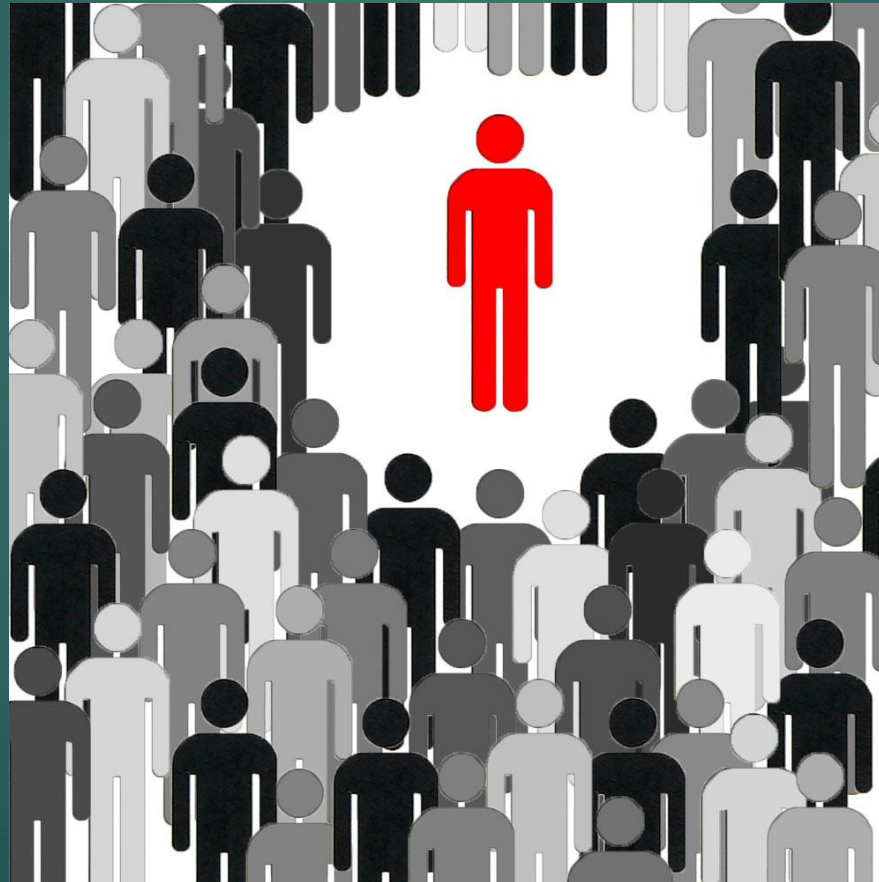
Climate change in IPCC usage refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.

Links to studies

- ▶ Oreskes 2004 science.sciencemag.org/content/306/5702/1686
(see also the correction in search terms)
- ▶ Doran and Zimmerman 2009 onlinelibrary.wiley.com/doi/10.1029/2009EO030002/abstract
- ▶ Anderegg et al 2010 www.pnas.org/content/107/27/12107.abstract
- ▶ Cook et al 2013 iopscience.iop.org/article/10.1088/1748-9326/8/2/024024
- ▶ Verhagen 2014 (not reviewed in this report)
- ▶ Stenhouse 2014 (not reviewed in this report)
- ▶ Carlton 2015 iopscience.iop.org/article/10.1088/1748-9326/10/9/094025/meta
(mentioned in the presentation as it references non-climate scientists)

Groupthink and Herd Mentality

The 97% figure is no accident



Asch Conformity Experiment

- ▶ Humans are highly compliant, herd mentality beings who are easily swayed by apparent majority views, especially by role-dominant experts. Asch (1951) Schacter (1951) Cialdini (2006)
- ▶ Humans are strongly averse to rejection or exclusion. Sarnoff & Zimbardo (1962) Williams (2007)
- ▶ Consequently, the claim that a statistical majority, nearly 100% of role-dominant expert individuals like scientists agree to a sweeping statement about climate change, is very effective in swaying public opinion.
- ▶ Even when the evidence argues against the consensus claim...

Excerpt of: **97% Consequential Misperceptions: Ethics of Consensus on Global Warming**
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2887245

Asch Conformity Experiment Video



- ▶ In short: Asch found that people generally conform to the group, even when the evidence obviously contradicts the group view.
- ▶ In the experiment, the social pressure of the 'group' that intentionally gave the wrong answer when asked which line matched another in size, caused the naïve subject to also give the wrong answer (when stating the answer out loud).
- ▶ When given a pre-arranged ally who said the correct answer, or when allowed to privately write down the answer, those tested found the courage to state the correct answer, even though it went against wrong answers of 'the herd.'

From: youtube.com/watch?v=NyDDyT1IDhA

Social Proof - Cialdini

As noted by Cialdini (2006), the author of “Influence:”

“We need only make a conscious decision to be alert to counterfeit social evidence. We can relax until the exploiters' evident fakery is spotted, at which time we can pounce.”

“And we should pounce with a vengeance. I am speaking of more than simply ignoring the misinformation, although this defensive tactic is certainly called for. I am speaking of aggressive counterattack. Whenever possible we ought to sting those responsible for the rigging of social evidence. “

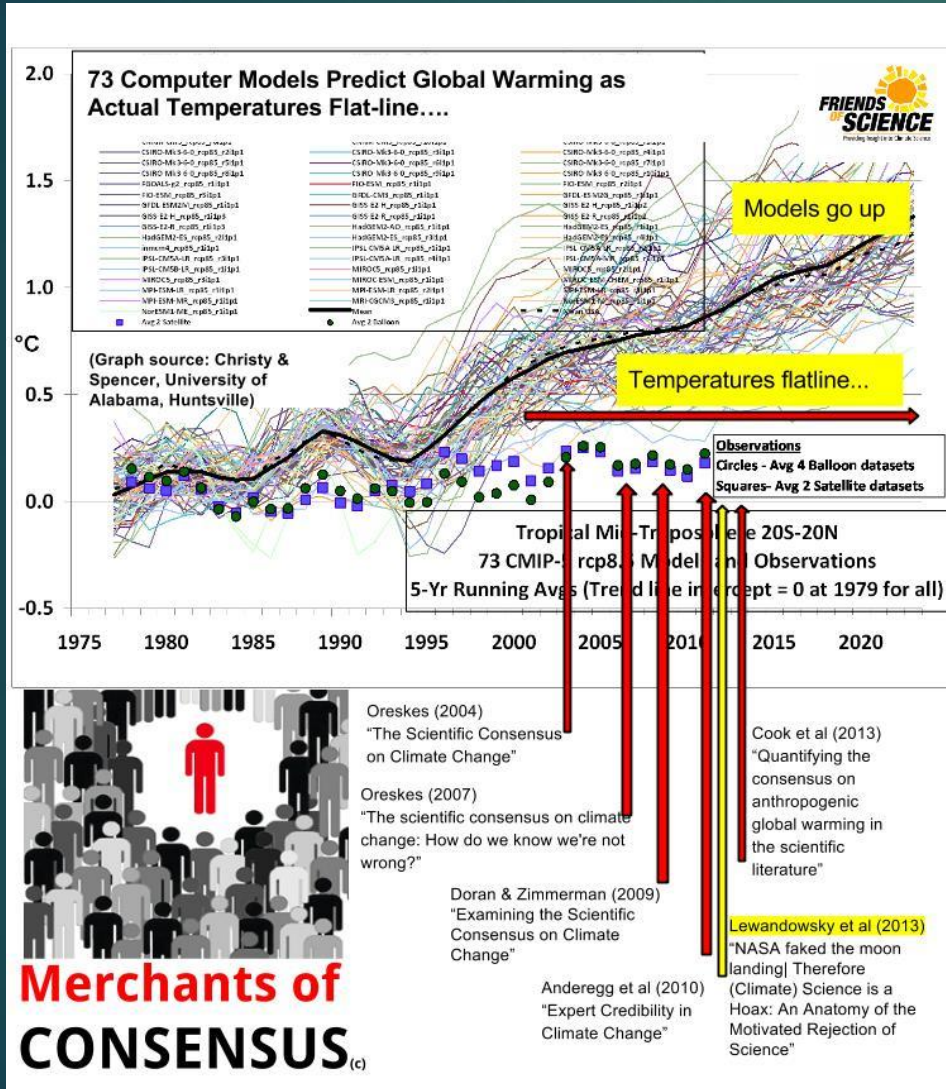
Excerpt of Friends of Science report: “97% Consensus? No!...”

Ostracization – Kipling D. Williams

Williams (2007) expresses the outcome of being ostracized (i.e. the excluded 3%) - as “the kiss of social death.” Throughout the consensus papers, there are persistent pejorative references to those who challenge or dissent with the alleged consensus – the familiar terms of ‘contrarian,’ ‘denier,’ ‘conspiracy theorist,’ ‘manufacturers of doubt,’ etc. are dotted throughout these research papers. Indeed the Lewandowsky (2010) paper, despite a single reference to ‘legitimate’ skepticism within the document, in some quarters he has successfully and publicly tarred all potential climate change consensus challengers with the brush of conspiracy theorists simply through his much cited inflammatory title^{lvii}.

Excerpt of Friends of Science report: “97% Consensus? No!...”

Merchants of Consensus



- ▶ This image shows a backdrop of 73 computer climate models (simulated predictions) going UP ... (average marked as black line)
- ▶ The blue circles and squares are weather balloon observations showing **actual** temperature data observations which have **flatlined** since 1998.
- ▶ Note the number of 'consensus' studies increases (red arrows + yellow highlight) as temperatures diverge from modelled predictions.
- ▶ The yellow highlighted paper tries to make out that all dissenting voices are whacky conspiracy theorists.
- ▶ The evidence suggests otherwise...

Ethical Dimensions

- ▶ Humans have four ultimate concerns - death, freedom, isolation, and meaninglessness - according to Yalom (2008).
- ▶ Climate change is an existential threat that easily and neatly fits all of these. Human history is driven by pivotal myths/representations of recurring apocalyptic weather events from Noah's flood (and related iterations in non-Judeo-Christian cultures) to contemporary horrors like the tsunami of 2004 in Indonesia.
- ▶ Thus, to ensure fair and appropriate public understanding of climate change, scientists and environmental activists alike must be careful to state the nuances and uncertainties about human effects on climate in a responsible manner.
- ▶ By failing to reference natural influence or these uncertainties Cook et al (2016)* creates a false and misleading public perception that humans are solely responsible for global warming/climate change, that fossil fuel use/greenhouse gases are the sole factor, that humans can successfully stop global warming/climate change by reducing fossil fuel use, and that 'any' cost is acceptable to prevent a perceived danger.
- ▶ Two best loved stage musicals – “Joseph and the Amazing Technicolor Dreamcoat” and “Les Miz” are both set on backdrops of climate catastrophe.

* Cook et al (2016) is a “Consensus on Consensus” study : **“Consensus on consensus: a synthesis of consensus estimates on human-caused global warming”**

iopscience.iop.org/article/10.1088/1748-9326/11/4/048002/meta

Text above is an excerpt of: **97% Consequential Misperceptions: Ethics of Consensus on Global Warming**
papers.ssrn.com/sol3/papers.cfm?abstract_id=2887245

Ethics and Economics

- ▶ Thus, those swayed by Cook et al (2016) claims of consensus should be aware of the cautionary review by IPCC Lead Author and economist Richard Tol noted in a 2015 article:

“... a century of climate change is not worse than losing a decade of economic growth.”

www.lse.ac.uk/GranthamInstitute/news/the-economic-impacts-of-climate-change-richard-tol/

97% Consensus?
No. No Consensus.
Not even close.
They're fooling you.

**The sun is the main driver
of climate change.
Not you. Not CO2.**

 EARTH TO SCALE

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**97% Consensus
on Global Warming?**

NO.

No consensus.
Not even close.
They're fooling you.


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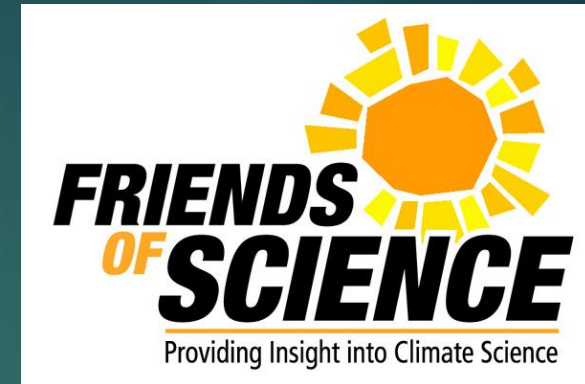





Archival image of award-winning copywriting.

Additional Resources

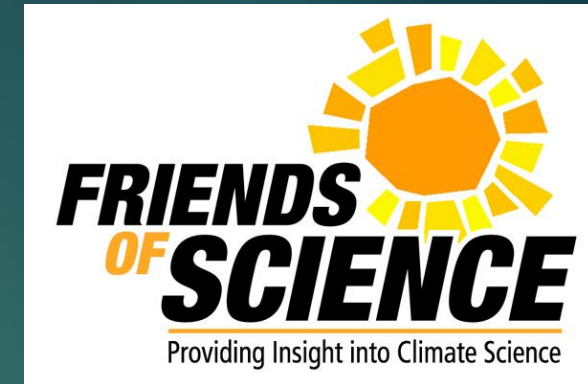
- ▶ “97% Consensus? NO! Global Warming Math Myths and Social Proofs”
friendsofscience.org/assets/documents/97_Conensus_Myth.pdf
- ▶ “Infiltration” www.friendsofscience.org/assets/documents/Infiltration2015.pdf
- ▶ “Infiltration” videos – 3 parts www.youtube.com/T02y6-NRFPs
- ▶ “Consensus Nonsense on 97%: Science is not a Democracy”
papers.ssrn.com/sol3/papers.cfm?abstract_id=2807652
- ▶ “97% Consequential Misperceptions: Ethics of Consensus on Global Warming”
papers.ssrn.com/sol3/papers.cfm?abstract_id=2887245
- ▶ Friends of Science ask NASA to Revise 97% Consensus Statements on Climate Change and Global Warming
www.prweb.com/releases/2015/03/prweb12556265.htm

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About Us



► About

Friends of Science has spent over fourteen years reviewing a broad spectrum of literature on climate change and have concluded the sun is the main driver of climate change, not carbon dioxide (CO₂). Friends of Science is made up of a growing group of earth, atmospheric and solar scientists, engineers, and citizens.

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